Industrial Automation Using the Internet of Things (IOT)

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Abstract

All running technologies have been on the verge of getting replaced by a great system that provides very specific, efficient and quick access and controlling for the devices as per user demand. That is nothing but IoT that stands for 'Internet of Things'. It deals with bringing control of devices over internet.In thiswide scope, Mobile communication skill is playing a main role in the world of modernization[4]. The internet of things (IoT) is the network of physical devices, vehicles, buildings& items embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data. Our project aims at disconnected connections and develops communication between machines. In one place, users can access all mechanisms in the industry. This automates the entire system. We provide efficient industrial automation systems that allow users to effectively control industrial devices/machines via internet. Filling is an operation performed by machines that pack liquid products such as cold beverages or water. The traditional method of filling bottles has been to place the bottles on a conveyor and fill only one bottle at a time. This method is time consuming and expensive. In order to reduce manual overhead, industries are implementing the Internet of Things (IoT) in their industries to monitor and inform those responsible for taking appropriate action to partially meet their requirements. You can use artificial intelligence to control and monitor industries.

Keywors: Internet Of Things(IoT), Arduino Interface, RFID (Radio Frequency Identification)

Introduction

The Internet of Things (IoT) is a new Internet revolution that can be viewed as an upward expansion of Internet services. The Internet of Things is defined in many ways and encompasses many aspects of life, from homes and cities to cars and roads, to devices that track human behavior on the road and use the collected data for push services. A network of physical objects or "things" embedded in electronics, software, sensors, and network connections that enable these entities to collect and share data. 15-20 years ago, technologists and researchers said they felt and discussed the benefits of interconnecting all kinds of devices and sensors everywhere, referred to as "Machine-to-Machine Control". This M2M communication and control is considered a key part of IoT. The foundation of IoT starts with RFID (Radio Frequency Identification) technology. A tag with an RFID microchip can transmit identification information, location to a reader and control any object via wireless communication.

Block diagram

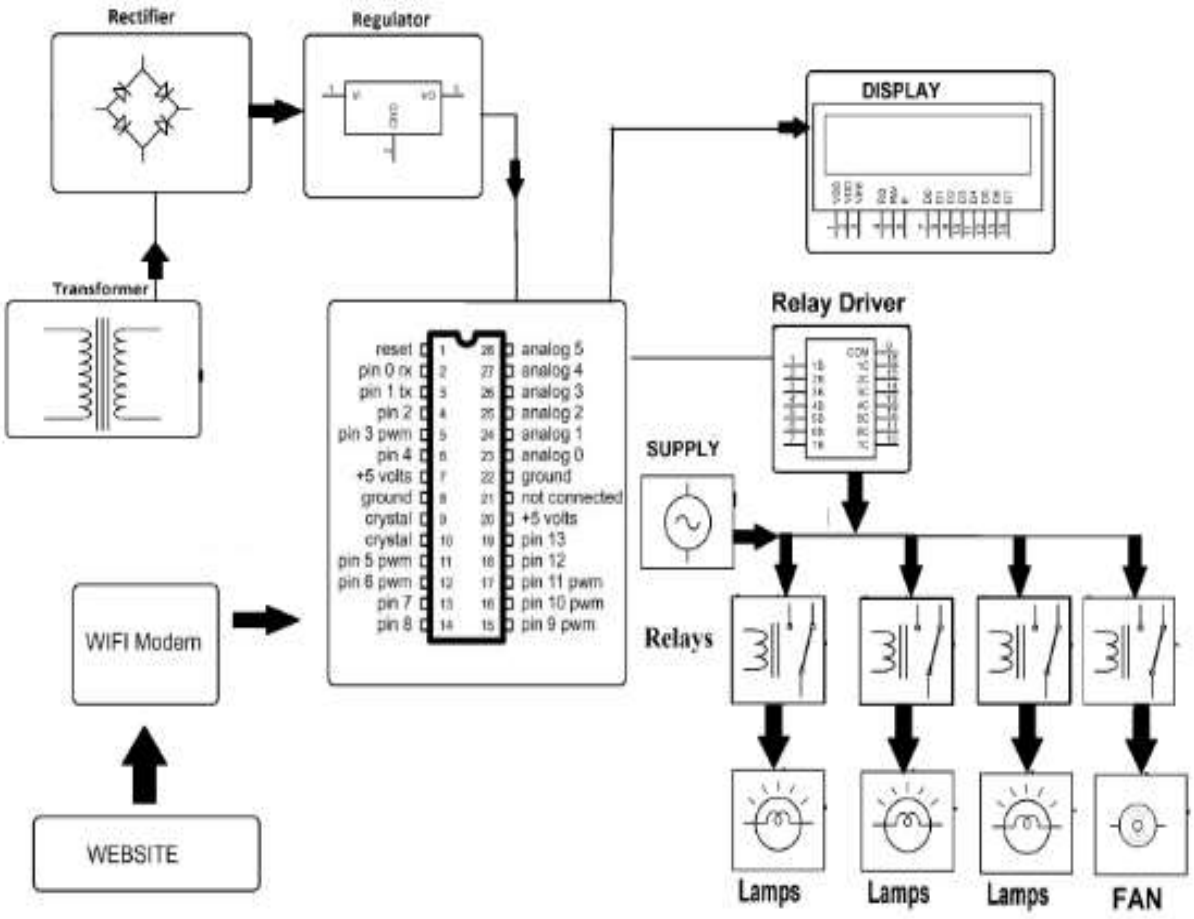

Fig. Block Diagram

Here is a block diagram for this project "Wifi Controlled Automation Using ESP8266". The Wi-Fi module obtains the graspfrom mobile phone and permits to relay circuit. As per the assumed signal from the user, the relay circuitswapped ON/OFF the respective devices. The main drive of by Wi-Fi wireless technology is to deliver a betterlevel to variety and better feasibility [3].

It is simple and easy to understand NodeMCU & ARDUINO is interfaced with 4 channel Relay using GPIO Pins of NodeMCU. The output pin of the NodeMCU is connected to 4 different LEDs via a 220-ohm resistor. The NodeMCU is connected to Local Wifi and is capable of receiving a signal via the Internet. The Android Device has a " Android app installed on it. To control the NodeMCU input/output, the IP address of NodeMCU is entered on the Android App IP box. Once this setup is done, you can control the Android App staying in any part of the world. Your Android Phone acts as a remote and NodeMCU as a receiver and signal are transferred via the Internet.

Equipment:

POWER:

This project uses circuits and motors that require +5V and +12Vdc power and the following power supply circuits provideregulated +12V and +5Vdc voltage currents to meet thisrequirement.

Operation:

Four diodes (IN4007) are connected to the secondary winding of a transformer in the bridge to rectify AC to DC.1000uF and 1uF capacitors are used as filters. A red LED indicates that rectification and filtering are OK. +5VDC is used as a DC voltage regulator and converts +5V to DC voltage regulated by +5V. A green LED indicates that the 7805 output is OK.

Feasibility

This project is specially designed for authorized users.Starts secure Internet communication through the Internet around the existing network using the network. This project is technically feasible. The system consists of a client-server architecture and is written in an easily accessible Java language. This system is free from technical risks. You can easily access all the resources your system needs.

Economic Feasibility

Economic Feasibility is the evolution of the weighted development costs derived from the developed system, and the resources required for the system are readily available. The developed system is mainly developed for research purposes, so economics is not a big issue.

Cost Benefit Analysis

This includes changes in development costs weighted against the final revenue generated by the developed system. The various expenses required for this project are as follows:
1. Actual cost of purchasing or leasing equipment. This includes the cost of computer systems, Android phones.
2. Operating system installation cost.
3. Application software cost.
4. Data collection costs.

The system is economically viable as it does not require off-the-shelf network-related software and requires no external interfaces.

APPS

There are billions of devices connected to the Internet and sensors.Here is a sample list of things based on the Internet of Things.

1. Monitoring and control of tracking systems for railway tracks, ships.
2. Air or water quality management system.
3. Earthquake or Tsunami Early Warning System.
4. Heating and air conditioning systems.
5. Entertainment and home security devices.
6. Intelligent traffic control or vehicle control system.
7. Electronic toll collection system.

RESULT ANALYSIS

1.The results made possible a more detailed understanding of these new technologies, which may aggregate in future projects, observing a more robust environment, with different types of equipment, due to its vast platform, as well as

the internet communication, which enables communication between different types of devices, it is intended as a future project, to present the results of a more detailed study that involves the security part of the information, since the large amount of equipment accessed remotely, can provide ways to obtain data during the transmission of information, this provides a new opportunity for study.

2.The first step in the project was the installation of the components in the Arduino interface, first the NodeMCU device [25] was used, which should act as an Arduino, because it has a higher capacity and speed than the Arduino, besides having a sensor WiFi was already integrated, as informed by the manufacturer, it was necessary to install the packages for the location of the device and its updates:http://arduinoesp8266.com/stable/package_esp8266com_index. json.This setting must be done in the IDE configuration to properly detect the device.

CONCLUSION

We are developing industrial applications using Internet of Things technology. We aim to provide industrial device monitoring applications. We aim to serve as an effective framework for building networks of sensors and actuators that can help improve the performance of industrial gadgets/activities.

IoTadoption are cost, finding competent suppliers, and training staff. Appropriate controllers and computers must be installed. Process initiation software is a key element for successful implementation. For the new plant, a fully integrated hardware concept with intelligent sensors, powerful embedded controllers and a panel PC connected to an IP-enabled network is a prerequisite. Replacement of existing equipment with newer, IoTfriendly ones can be done in phases. The end users and machine builders can leverage their existing investments in technology and take advantage of new IIoT technologies. As the necessary global standards are being mature, in reality, it may well take another few years to realize the full potential of IIoT.

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